Chapter 3

JTAGS Detachment Operations

Commanders seek to apply overwhelming combat power to achieve victory over the enemy with minimum casualties to friendly forces and assets. Combat power combines the elements of maneuver, firepower, protection, and leadership to achieve battlefield dominance. While contributing to all four elements of combat power, TMD makes its greatest contribution through force protection. Protection conserves the fighting potential of fielded elements, enabling the commander to apply overwhelming combat power at the decisive time and place. Force protection includes all the active and passive actions that units and individuals take to preserve combat power and deny the opposition the ability to successfully attack friendly forces.

SECTION I ¾ THEATER MISSILE DEFENSE OPERATIONAL ELEMENTS

3-1. JTAGS supports all TMD operational elements: passive defense, attack operations, active defense, and BM/C4I.

3-2. The key to JTAGS theater support is its relatively direct connectivity and distribution architecture via a variety of voice reporting and data warning networks, particularly when it is deployed in theater and linked directly to a TOC. Event data is received directly from DSP satellites covering the AOR, processed in theater, and disseminated to both theater and worldwide users by data and by voice. By its in-theater location, JTAGS reduces the possibility of single-point failure in long-haul communication architectures.

PASSIVE DEFENSE

3-3. Passive defense measures are initiated to reduce vulnerability and to minimize the damage caused by TBM attacks. Passive defense includes TBM early warning, nuclear, biological, chemical (NBC) protection, countersurveillance, deception, camouflage and concealment, hardening, electronic protection, mobility, dispersal, redundancy, recovery, and reconstitution. It provides for essential individual and collective protection for friendly forces, population centers, and critical assets. Passive defense measures should be planned whenever US forces face a threat.

3-4. Passive defense measures may be employed by ground forces and threatened civilian populations either as preparatory activity or in direct response to receipt of a TBM attack warning message from the JTAGS. A warning report contains the predicted ground impact point and time, allowing for selective redistribution of information to the targeted area. The

intent is to maximize the warning time and, thereby, minimize the effects of TBMs not destroyed in flight and collateral effects from TBM engagements.

3-5. The highest echelon elements using JTAGS information to initiate passive measures will receive JTAGS information directly and primarily by data, while lower and lowest echelons will receive JTAGS information indirectly and primarily by voice broadcast. In accordance with Joint Publication 3-01-5, Joint Theater Missile Defense (11-7), component commanders are responsible for providing warning to assigned and attached forces in sectors vulnerable to attack. Recipients of voice warning messages received directly from the JTAGS will retransmit these warnings to subordinate echelons via their own organic networks. The difference in size between Desert Storm era and JTAGS warning areas is shown graphically in Figure 3-1.

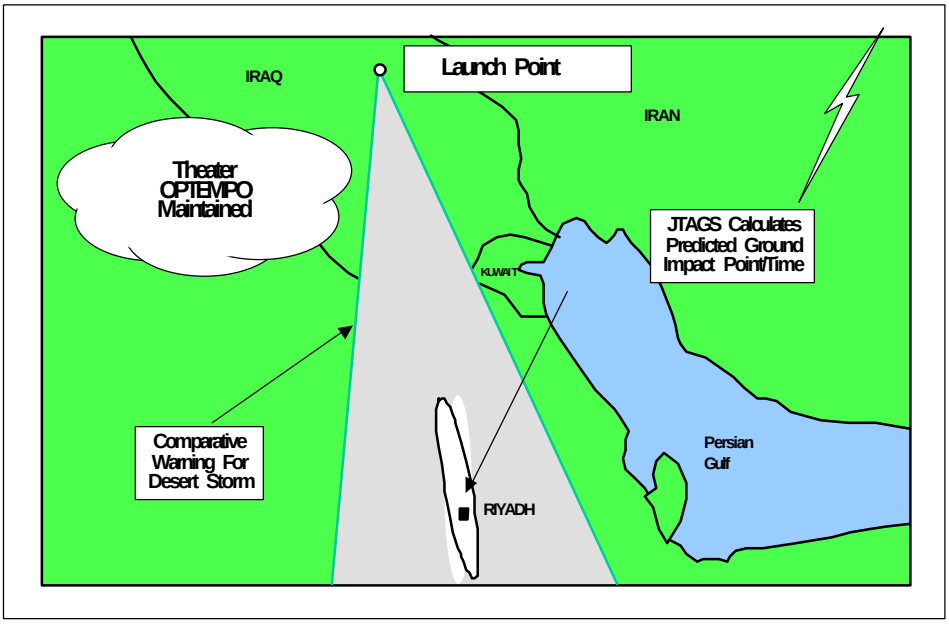


Figure 3-1. Passive Defense

3-6. Although voice reporting messages are expected to predominate in the passive defense arena, some units may also receive data warning messages, convert these to voice formats, and then initiate the implementation of their internal warning procedures. Host-nation and combined forces will normally be beneficiaries of JTAGS information, and theater commanders will determine how to best disseminate warning information to them.

ATTACK OPERATIONS

3-7. Attack operations apply to operations initiated to destroy, disrupt, or neutralize TBM launch platforms and their supporting command, control, and communication nodes; logistic structures; and reconnaissance, intelligence, surveillance, and target acquisition platforms. Attack operations require a fully integrated architecture for acquisition, processing attacks, and attack assessment of these targets. Not a mission unto itself, attack

operations characterize and integrate all actions initiated against TBM launch platforms and their supporting infrastructure. Attack operations can be preemptive or reactive as part of other military actions. Attack operations are challenged to detect TBM systems since they are normally dispersed, mobile, electronically quiet, and redundant, all of which makes striking them difficult.

3-8. Attack operations command and control nodes will be provided with JTAGS-produced launch point/time information to facilitate planning and execution of fire missions and other offensive missions (e.g., air strike or special operation force attacks) against TBM launchers and infrastructure. Army attack operation units equipped with tactical information broadcast service (TIBS) receivers (commanders tactical terminals (CTTs)) have the capability to receive information from the JTAGS via broadcast networks, thereby shortening response times on receipt of a fire mission. TIBS receivers are expected to be employed at corps, division, and brigade fire support elements (FSEs) and attack aviation regiment/brigade/battalion TOCs. A notional picture of how JTAGS-provided TBM launcher location is utilized in attack operations is shown in Figure 3-2.

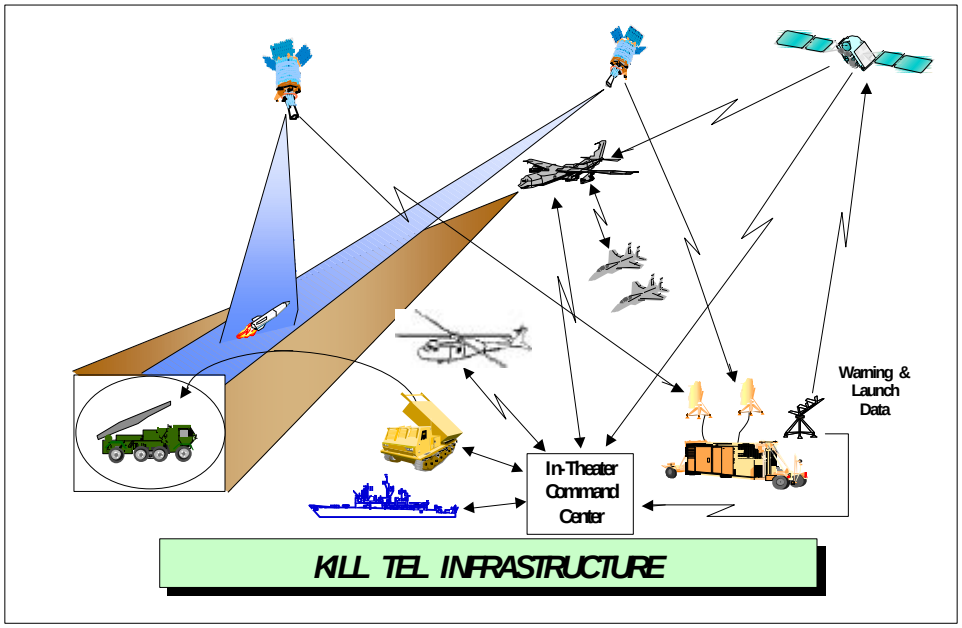


Figure 3-2. Attack Operations

ACTIVE DEFENSE

3-9. The role of active defense operations is to protect selected assets and forces from attack by destroying TBM airborne launch platforms and TBMs in flight. Active defense includes defense in depth against all classes of TBMs by using all available TMD assets in theater. Defense in depth provides multiple opportunities to negate TBMs with differing capabilities, increases probability of kill, and prohibits the enemy from being able to counter the defensive system with a single technique. It also includes electronic warfare attack to disrupt hostile remote or onboard guidance systems.

3-10. Active defense TMD units (e.g., Patriot) use positional information to initiate radar search actions to acquire TBMs. Army active defense units receive and process JTAGS data warning directly at brigade and battalion TMD task force TOCs primarily from the TIBS and the joint TMD C4I TADIL-J net. The battalion then processes the information and passes it to the lower tier fire unit (battery) level to cue radar search and initiate an engagement sequence as appropriate. TBM task forces receive JTAGS information directly from broadcast networks in order to reduce acquisition and engagement timelines. JTAGS-provided TBM launcher location data is used to provide early detection in active defense operations and is depicted in Figure 3-3.

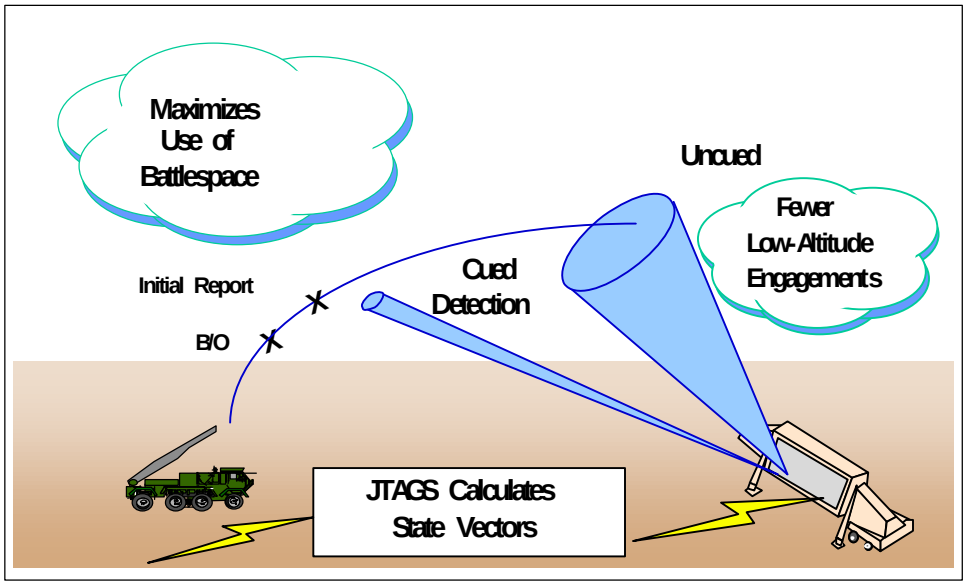


Figure 3-3. Active Defense

COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, AND INTELLIGENCE

3-11. C4I is the architecture and structure that allows the theater CINC and theater forces to manage, coordinate, and conduct integrated operations.

3-12. For TMD missions, C4I is an integrated system of doctrine, procedures, organizational structures, facilities, communications, computers, and supporting intelligence assets. The integration must be accomplished using existing joint and service systems and resources efficiently to ensure integration with other operational functions. The Army's C4I system links passive defense, active defense, and attack operations to provide timely assessment of the threat; rapid dissemination of tactical warning; and mission assignment, targeting data, and poststrike assessment to the appropriate TMD element. C4I capabilities must support the principles of centralized planning, decentralized execution, and coordinated efforts by forces assigned TMD tasks.

3-13. An anticipated application of JTAGS information in the C4I arena is to cue joint srveillance target attack radar system (JSTARS) and other theater intelligence systems with TBM launch point/time information. Such information may, for example, enable these systems to acquire and to track a TBM launcher back to a reload point, hide site, or haven and then pass this new location/target to attack operation elements. Table 3-1 summarizes theater missile defense operational elements.

Table 3-1. JTAGS Theater Support

TMD OPERATION	INFORMATION	BATTLE MANAGEMENT UTILITY
Passive Defense	Launch Warning	Allows personnel to take cover and assume appropriate MOPP.
	Impact Point/Time	Impact area prediction allows warnings to be selectively focused.
Attack Operations	Launch Point	Launch point information with sufficient accuracy and timelines allows sensor hand-offs to support attack operations and intelligence analysis.
	Launch Time	Launch time enables evaluation and selection of appropriate response.
Active Defense	State Vector Launch Time	State vector and launch time would allow active defense system sensors to acquire faster and farther out, thus enabling earlier engagements.
	Impact Point/Time	Impact point prediction supports readiness for specific elements of the active TMD force.
C4I	Support C2 Processes, Situational Awareness, and Intelligence Preparation of the Battlefield by Distributing Event Information	Proper application of C4I enables the commander to selectively apply and maximize his combat power at critical points in time and space on the battlefield to counter the TBM threat. C4 is used to integrate all other elements by: Supporting passive operations; Directing and prioritizing appropriate attack operation activities; Increasing employment effectiveness of active defense elements; Supporting collection missions of other platforms (e.g., JSTARS).

SECTION II ¾ ORGANIZATION OF JTAGS DETACHMENT

3-14. Each JTAGS detachment consists of a small detachment headquarters element and one or more, usually two, JTAGS operational sections based on contingency or operational requirements. A JTAGS section is manned by a warrant officer officer in charge (OIC), operations sergeant, equipment records/parts sergeant, and 12 operators. Crews are multiservice (Army and Navy) with four shifts available for sustained 24-hour operations.

DETACHMENT HEADQUARTERS

3-15. Two detachment headquarters are needed to support two simultaneous major theaters of war. JTAGS is capable of operating 24 hours per day for extended periods only when deployed as a detachment. Each shift consists of a senior operator (crew chief) and two operators. Additionally, each detachment can include support personnel (assigned or attached) to provide for minimal sustaining operations in the event JTAGS is deployed independently of a US support infrastructure, such as in peacekeeping operations.

PERSONNEL REQUIREMENTS

3-16. The JTAGS detachment shown below in Figure 3-4 consists of two sections and a detachment headquarters. Personnel requirements by position and rank are also shown.

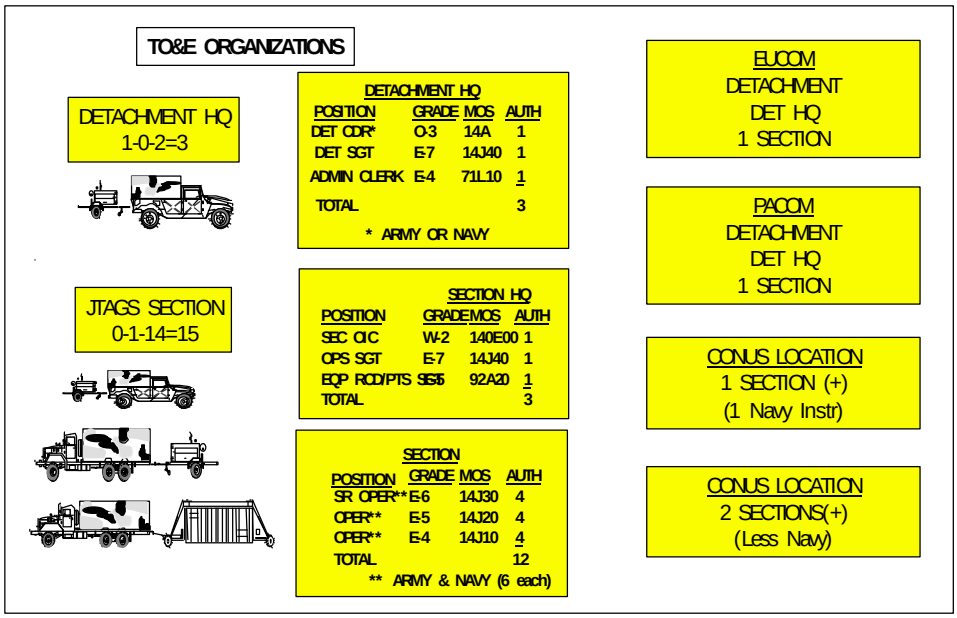


Figure 3-4. JTAGS Detachment Personnel

SECTION III ¾ PERSONNEL

MANPOWER

3-17. The force structure to support JTAGS consists of active duty personnel from the Army and the Navy. Because of joint service manning, there are joint service force structure and training implications for the unit that JTAGS leadership must consider (i.e., deployment differences in permanent change of station and temporary duty; personnel efficiency reports; and physical fitness testing).

PERSONNEL

3-18. Army enlisted soldiers assigned to JTAGS detachments as operators have air defense artillery military occupation specialties. Naval enlisted personnel have an operational specialist, electronic warfare, or intelligence specialist rating.

SENIOR OPERATOR (CREW CHIEF)

3-19. He is responsible for all shift actions and omissions that impact mission accomplishment. The crew chief has message release authority. The crew chief is also responsible for facilitating situational awareness within the theater of responsibility by applying information drawn from daily intelligence summaries to specific areas and periods of interest. The crew chief focuses the attention of the crews and monitors and reports on the status of communication links and the JTAGS system. In event of absence or incapacitation of operators, the crew chief must be able to perform event processing and reporting.

SYSTEM OPERATORS

3-20. System operators interpret and react to TBM warnings displayed on computer-generated console displays. JTAGS internal operations are performed by two operators, each at a work station independently capable of providing either a theater overwatch or "zooming" capability to focus on selected areas of the battlefield (e.g., suspected TBM launch areas). These two operators are also able to monitor independent, but simultaneously occurring events in a large geographic area of responsibility. The area of exploitation for the operators is dependent on the coverage provided by DSP, the location of operations for deployed forces, and the location of enemy launch areas. Each operator position can function independently with common data and communication accesses. The operators can choose to selectively view event data. The operators perform event reviews, validate events as TBM launches, and initiate transmissions of warning information according to theater-established reporting requirements and rules and selected modes of operation. JTAGS can be programmed to operate in an “automatic mode” that sends warning messages without operator intervention.

VOICE REPORTING AND DATA WARNING

3-21. For voice reporting, one operator transmits on the radio broadcast network while the other operator optionally initiates a telephone conference call. These functions can also be performed by the crew chief. Actual voice reporting operations and procedures are based on theater requirements. In data warning, an operator manually releases messages; however, automatic message generation and release are available as an optional selectable mode to handle multiple, near simultaneous launches or as the primary operational mode once missiles have been fired. In the full automatic mode, operators continuously review the situation and manage by exception. JTAGS records DSP sensor downlink data, message outputs, and systems operation, data for postevent analysis, maintenance, and training applications.

SECTION IV ¾ MAJOR ITEMS OF EQUIPMENT

3-22. JTAGS mission equipment is grouped into seven major subsystems: antenna, receiver/decryptor, processor, power, shelter, mobilizer set, and communications. The subsystems are pictured below in Figure 3-5. Equipment dimensions and weights may be found in appropriate technical manuals (TMs).

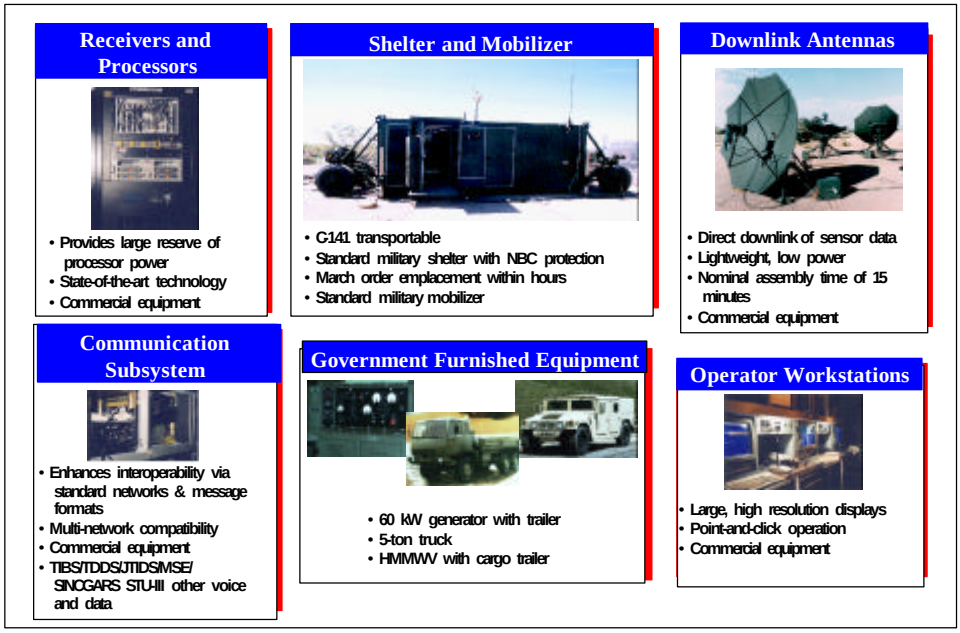


Figure 3-5. JTAGS Hardware

ANTENNA

3-23. The antenna subsystem accepts DSP downlink data streams, converts the data stream from S-band to intermediate frequency (IF), provides radio frequency filtering, and controls antenna switching, positioning, and signal combining.

RECEIVER/DECRYPTOR

3-24. The receiver/decryptor decodes and decrypts data streams and distributes data and timing signals for DSP Link 1 and Link 2 data from up to three DSP satellites (DSP-1 and sensor evolutionary development (SED)). The JTAGS receiver allows global positioning of JTAGS without regard to DSP satellite type or degraded mode of performance. An input from the global positioning system (GPS) provides accurate Greenwich mean time (GMT) and determines the JTAGS unit location and initial antenna pointing reference.

PROCESSOR

3-25. The data processing subsystem includes the data processing hardware and the operational software. The data processing hardware, computers, and peripherals provide the general purpose resources needed by the operational software to detect and report targets from the DSP data. The subsystem is designed with more than 100-percent computer expansion to ensure it can incorporate future TMD requirements. Four computer software components (CSCs) of the JTAGS operational software computer software configuration items (CSCIs) perform the data processing functions.

POWER

3-26. Commercial power, 120/208 volts alternating current (Vac), 60 hertz (Hz), three phase, is the preferred power source for JTAGS. The power unit (PU-805) is a source of electricity for the JTAGS shelter if compatible commercial power is lost or is unavailable in the theater. This is a standard military generator and has not been altered for use with the JTAGS system. The power subsystem provides a reliable, conditioned power source.

3-27. The PU-805 power unit is comprised of an MEP-816A tactical quiet generator (TQG) mounted on a modified 2½ ton, two-wheel trailer (M200A1). The TQG is rated at 60-kilowatt (kW) capacity at 50/60 Hz. The trailer has been modified with generator mounting rails, special fenders, an accessory box, and fire extinguisher brackets. The towing connections for the generator set are standard pintle-hitch air and electrical connectors.

3-28. Emergency power is provided by an uninterruptable power supply (UPS) system that is installed in the shelter. This unit provides emergency power to the computer system for approximately 7.5 minutes in the event of a power failure. The UPS is continually charged by either commercial power or by the PU-805 TQG. When power is interrupted, the UPS provides sufficient power to assure a graceful shutdown of all computers, thus preserving memory and preventing damage to equipment.

SHELTER

3-29. An International Standard Organization (ISO) shelter houses the following JTAGS components:

- Environmental control (air conditioning) unit.
- UPS.
- Three operator workstations.
- Power panels.
- Electromagnetic pulse (EMP) shielding.
- Communication equipment rack.
- Ground, electricity, lighting, and alarms.
- Three operator workstations.
- Data processor equipment or hardware rack.

MOBILIZER SET

3-30. JTAGS is equipped with a mobilizer set that allows the shelter to be towed. When traveling over improved roads, the maximum safe speed is 40 miles per hour.

COMMUNICATIONS

3-31. See Section X of this chapter.

SYSTEM DESCRIPTION

3-32. The shelter contains processing and communication equipment and provides a restricted and protected environment for the conduct of operations. One DSP downlink antenna dish and receiver is required to receive data from each satellite in the JTAGS field of view. A JTAGS section has three DSP downlink antenna dishes and receivers. The above-described assemblage of equipment, together with associated personnel, constitutes a JTAGS section. A detachment's equipment is depicted below in Figure 3-6.

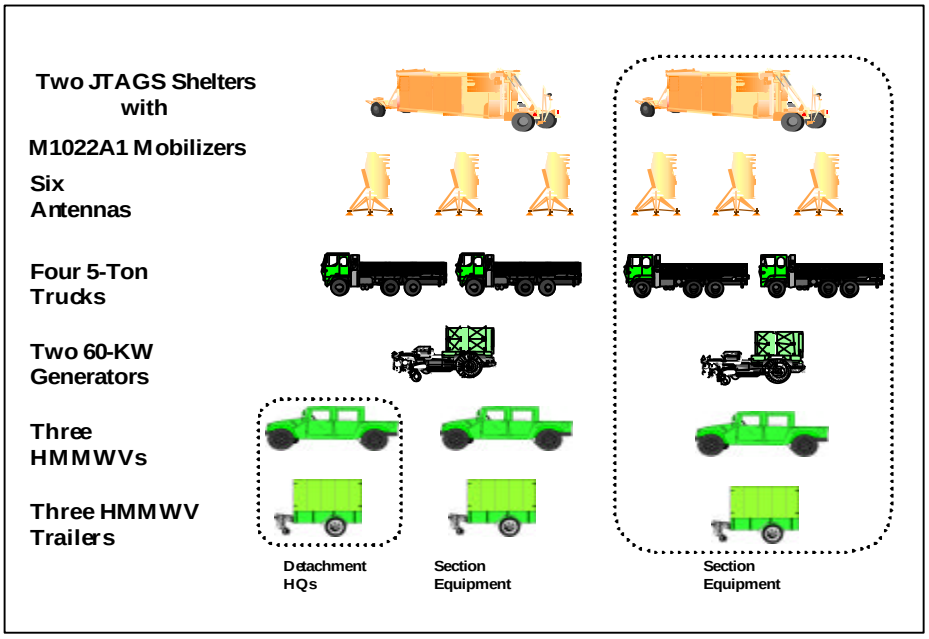


Figure 3-6. Detachment Major Items of Equipment

SECTION V ¾ SYSTEM CAPABILITIES AND LIMITATIONS

CHEMICAL AND NUCLEAR ATTACKS

3-33. Potential adversaries may have the capability to disrupt, destroy, or exploit the JTAGS by either electronic or physical means. The type of enemy conventional weapons used for physical destruction will be dependent upon the geographical location of the JTAGS. JTAGS communication and automation equipment is not vulnerable to chemical attacks except for

possible corrosive effects if surfaces are not cleaned. EMP generated by a high-altitude nuclear burst could cause electronic circuitry damage by entering systems through antennas and unshielded connectors and traveling through entire networks. EMP can damage any electronic equipment that is not properly shielded and could disrupt the data received from reporting satellites.

ELECTRONIC ATTACK

3-34. Additionally, the communication systems used to receive and transmit the information produced by JTAGS will be susceptible to interception, direction finding, and jamming. The sensor downlink receiving antennas integral to JTAGS will be susceptible to radio frequency (RF) interference. A disruption in the flow of either downlink data or output information at critical times would impair the effectiveness of the JTAGS.

SABOTAGE

3-35. The automated equipment, shelters, and support equipment of the JTAGS could be vulnerable to sabotage by enemy agents inserted into rear areas. Human exploitation methods may also target system operators in order to learn about the vulnerabilities associated with the operating system, software programs, or data bases.

WEATHER

3-36. Antenna systems may be susceptible to damage from ice, snow, and water accumulation and are not likely to be protected from the weather because they are located on the ground in uncovered positions.

SECTION VI ¾ CONCEPT OF DETACHMENT OPERATIONS

EMPLOYMENT IN THEATER

3-37. JTAGS sections are expected to be echeloned into theater, but should eventually be employed in pairs as a full detachment. Each of the two sections is capable of independent operations at separate locations within a theater. Both JTAGS sections receive and process DSP data; however, only a single JTAGS will normally be tasked to broadcast voice reporting and data warning information. Actual mission profiles are situationally dependent. Multiple employment options in accordance with (IAW) theater OPLANs provide for a high degree of operational flexibility.

RECEIPT AND PROCESSING OF DSP DATA

3-38. JTAGS receives and processes DSP IR data streams from one or more DSP satellites. The DSP IR data is processed to identify TBMs during missile boost phase and to identify other IR events of tactical interest.

3-39. JTAGS classifies DSP data as TBM launches or other IR events. TBM launch reports are broadcast immediately as an initial warning message

announcing TBM(s) in flight. The initial message includes estimated launch point and time of launch and, if sufficient data is available, predicted ground impact point and time of impact. This message is sent out over all communication means available to and designated by the theater CINC or his designated representative. The Area Air Defense Commander, in accordance with joint doctrine, is responsible for ensuring that allied and coalition forces receive TBM warning. Figure 3-7 displays how DSP satellites monitor their respective AORs for TBM launches and transmit data to the JTAGS.

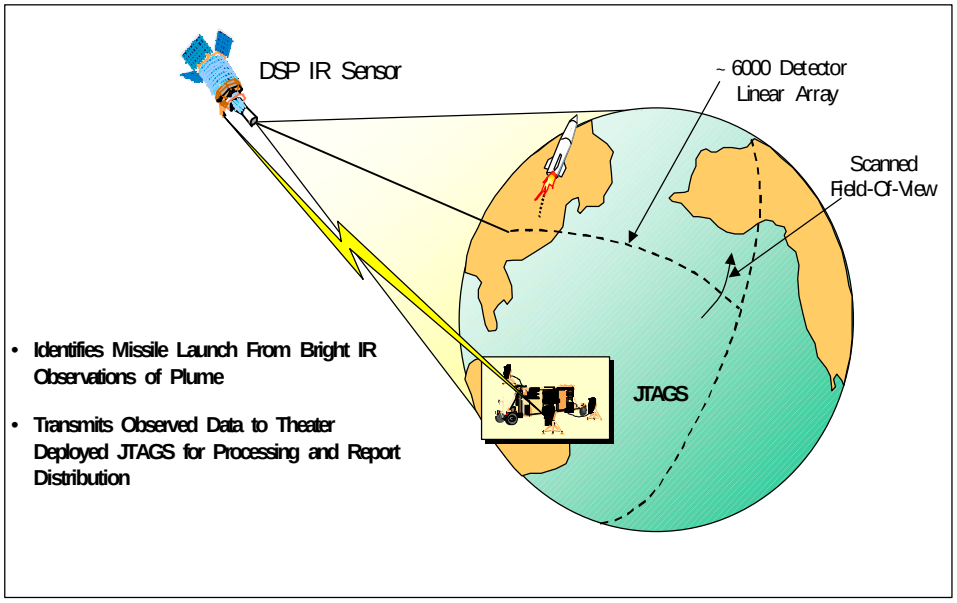


Figure 3-7. DSP Connectivity

3-40. JTAGS continues to receive IR data throughout the TBM boost phase. Based upon this information, JTAGS refines, updates, and broadcasts changed information. Broadcast of update information is accomplished according to reporting rules established by the combatant CINC in coordination with CINCSPACE. The update messages provide positional information for cueing sensor systems and potential correlation of JTAGS trajectory predictions with tracking sensors. Additionally, repetitive broadcasts provide for increased probability of message receipt, alert newly tuned-in listeners on the communication net, and allow for the addition of track amplifying information from other reporting sources.

3-41. At the conclusion of receipt of IR data, TBM messages and message sets containing final predicted ground impact point(s), predicted impact time(s), and state vector(s) are produced and broadcast. Depending on the protocols for the communication systems/networks, a "drop track" message may be sent soon after the final messages are sent.

3-42. Recipients of JTAGS data must perform necessary track data fusion/correlation and trajectory extrapolations. Fusion/correlation of JTAGS data with data from other sensors is not a current JTAGS capability; however, later system improvements could incorporate a fusion capability to

improve accuracy. Figure 3-8 depicts the relationships between strategic and tactical systems that enable the JTAGS to fulfill its mission.

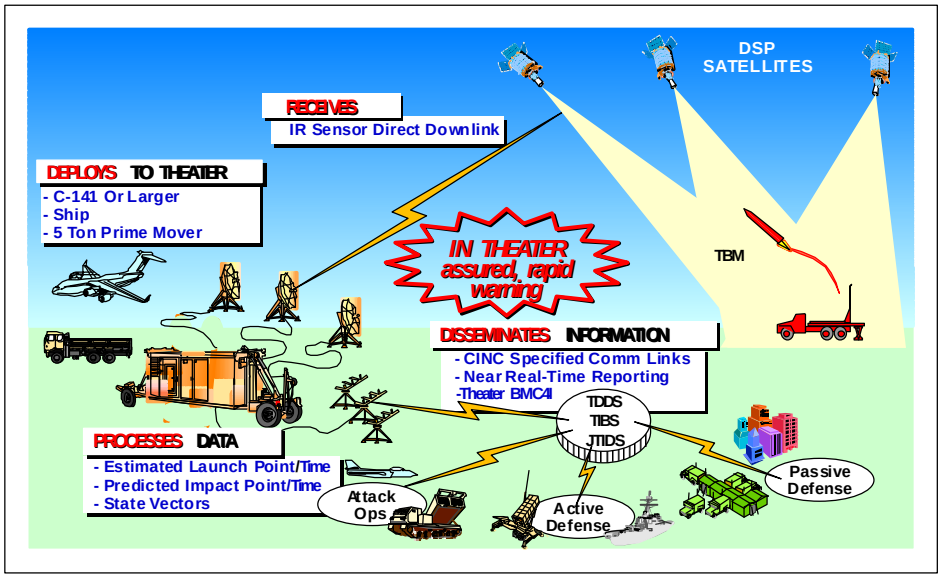


Figure 3-8. JTAGS Concept

SECTION VII ¾ JTAGS MODES OF OPERATION

3-43. The operators use the JTAGS operational software and the operator workstations to set up and control the three JTAGS modes of operations. The modes of operation are: operational mode; analysis, training, and test mode; and maintenance mode.

OPERATIONAL MODE

3-44. During the operational mode, the operator initializes the system and sets control variables such as area-of-interest (AOI) definition, BM/C4 nodes, communication interfaces, and automatic and manual report release. The operator then controls the manual and automatic operations of JTAGS. The operator's key objectives are (1) to validate the IR target detections in the designated AOI as TBM launches, IR events of interest, or special events and (2) to initiate transmission of early warning, alerting, and cueing messages in accordance with established theater reporting procedures. The operator also manages the recording of data for future analysis.

ANALYSIS, TRAINING, AND TEST MODE

3-45. During the analysis, training, and test mode, the operator can train by using the JTAGS-embedded training feature or play back recorded or simulated data for analysis, further training, or operator proficiency testing.

3-46. Embedded training allows the operator to operate, monitor, and generate reports by using the JTAGS system with data recorded on tape for training purposes. To operate the system in the training mode, an AOI must be identified and activated. Any current live operations must be terminated. When the training scenario is started and a launch is detected, data is collected automatically. At the end of the scenario, popup data appears for the operator to analyze the event. The training scenario can then be terminated and live operations can continue. Figure 3-9 summarizes JTAGS sustainment training.

Figure 3-9. Training

MAINTENANCE MODE

3-47. See discussion under FIXING in Chapter 4.

SECTION VIII ¾ DEPLOYMENT

STRATEGIC DEPLOYMENT TO A THEATER OF OPERATIONS

3-48. When considering forward deployments of JTAGS, combatant CINCs request allocation and deployment of JTAGS resources based on the assessed capabilities and intentions of the threat and the probability of tactical missile employment. JTAGS is strategically deployable and can be airlifted to a theater. JTAGS deployments are preplanned and prioritized in the time-phased force deployment list. The location of JTAGS in theater is determined by the theater CINC's needs and is generally influenced by security, logistics, and communication support considerations.

GENERAL PLANNING CONSIDERATIONS

3-49. JTAGS can be operational within 24 hours of arrival in a theater, excluding travel time. JTAGS is not capable of performing its primary functions during transport. JTAGS march order, emplacement, and operate (i.e., into action time) times are consistent with other theater-level tactical support systems.

AIR MOVEMENT

3-50. The JTAGS shelter is certified for transport on C-141, C-17, and C-5 aircraft. The shelter must be lowered to the aircraft floor during flight to relieve the dolly set's hydraulic system of flight-induced stress.

Note: Department of the Air Force, Headquarters Aeronautical Systems Center, Wright Patterson Air Force Base, Ohio, Transportation Engineering Agency (Attn: MTTE-DPE) requires that a copy of the Air Transport Certification of the ESCO M1022A1 dolly set, dated 25 January 1996, accompanies the dolly set each time it is airlifted.

C-141, C-17, C-5 LOAD PLANS

3-51. The C-141 aircraft has a weight limit of 45,000 pounds during peacetime and 58,000 pounds (lb) for wartime. For C-141 transport, the JTAGS and prime mover should not exceed 42,750 lb when loading on the C-141. This allows for additional cargo and equipment to accompany the JTAGS shelter. In peacetime, three C-141s are required for deployment because of weight restrictions. In wartime, two C-141s can deploy a JTAGS section. The JTAGS system has a roll-on/roll-off capability for air movement. Standard K-loaders available for C-141 aircraft are sufficient for handling the JTAGS system. See Figures 3-10 through 3-12 for specific load plans.

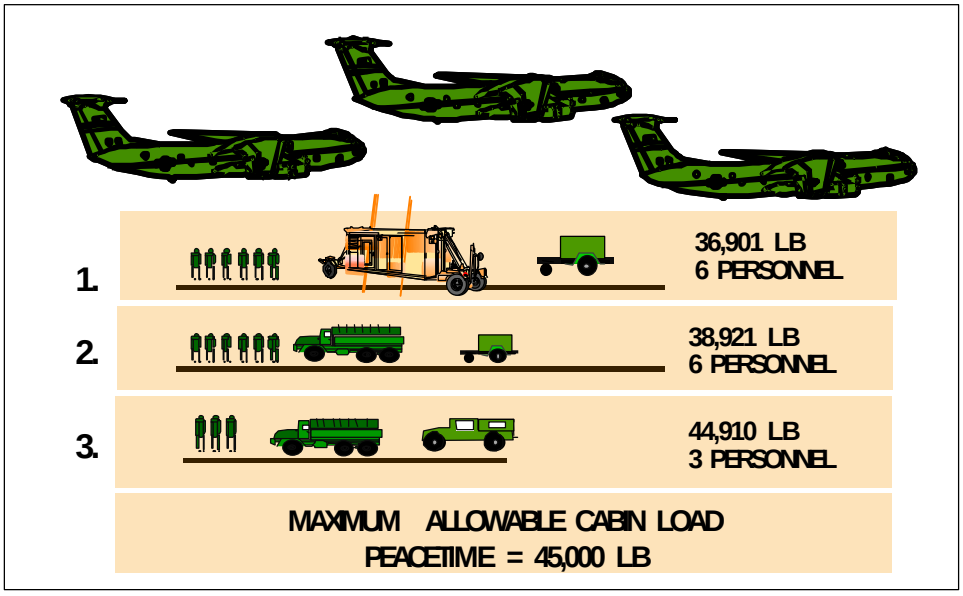


Figure 3-10. C-141 JTAGS Deployment

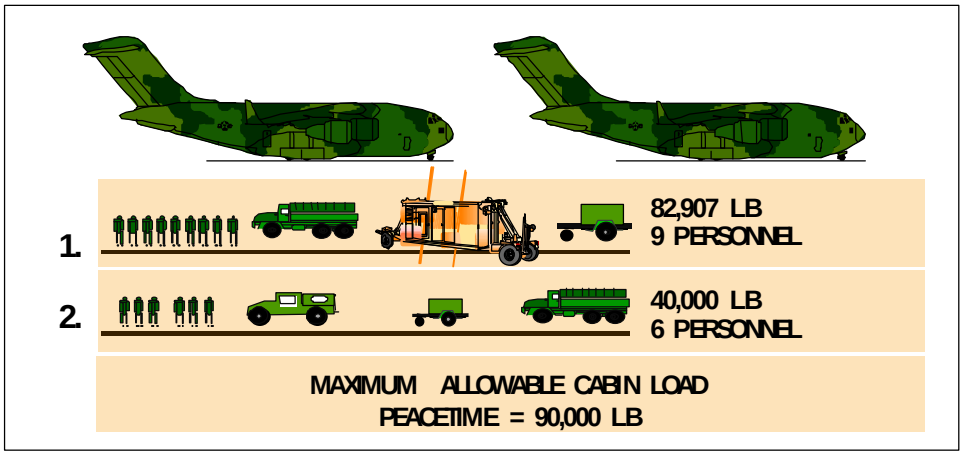


Figure 3-11. C-17 JTAGS Deployment

SEA MOVEMENT

3-52. The S280 ISO shelter is readily transportable by break bulk ships, barge-carriers (lighter aboard ship (LASH) and SEABEE), and roll-on/roll-off ships when loaded on special "flatrack" containers if transport by container ship is necessary. The JTAGS is transportable by the LARC-LX amphibious landing craft, mechanized (LCM-8), landing craft utility (LCU-1466 and LCU-1646), beach discharge lighter (BDL-MKI), and selected deck-cargo barges such as designs 231A, 7001, and 7005.

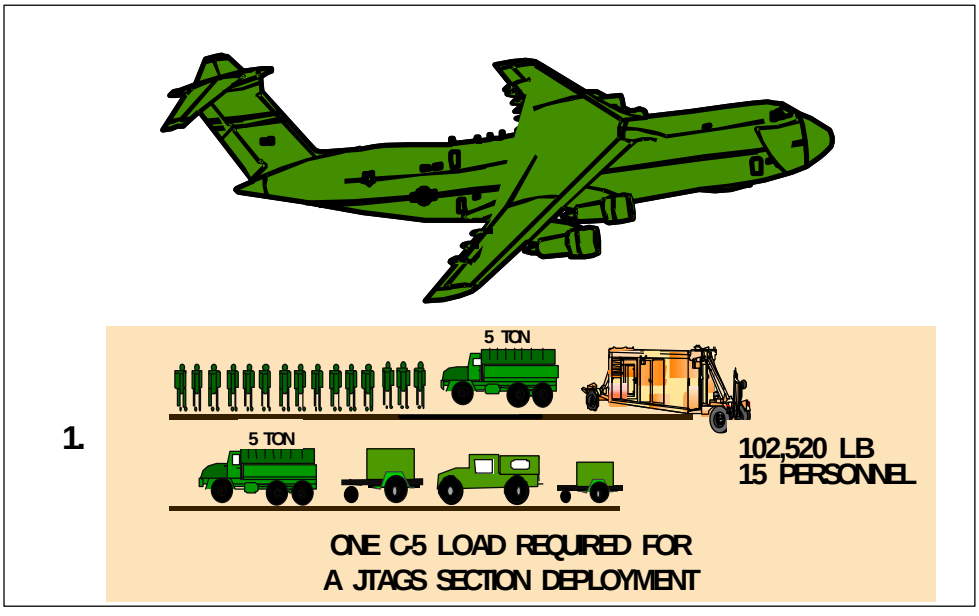


Figure 3-12. C-5 JTAGS Deployment

GROUND MOVEMENT

3-53. The JTAGS ISO shelter is transportable, but not mobile over rough terrain. The shelter is equipped with an M1022A1 mobilizer (dolly set) to transport it. The outrigger jacks are used to level and support the shelter.

MOVEMENT BY TRUCK

3-54. If the JTAGS shelter is moved via commercial highway transport, (i.e., tractor and lowboy trailer), special equipment (i.e., 10-ton crane) may be required to on-load/off-load the shelter.

OVERSEAS HIGHWAYS

3-55. For highway movements, the restrictive feature is the length of the JTAGS shelter and 5-ton truck (71 feet), which makes turning difficult. Additional restrictions are dictated by the size and weight of the prime mover. In Germany, march or movement credits (road clearances) are required and are obtained by the transportation movements officer where the movement originates. Any movement credits that are necessary because of excess width, length, and weight will be obtained through negotiations with the host nations. See the shelter and mobilizer dimensions contained in the JTAGS site preparation information in Appendix B.

MOVEMENT BY RAIL

3-56. JTAGS is neither designed nor approved to be moved by rail.

SECTION IX –¾ SYSTEM OPERATIONS

EMPLOYMENT AND OPERATIONS UNDER NORMAL CONDITIONS

3-57. The mission, enemy, terrain, troops, time available, and civilians (METT-TC) affect employment of JTAGS. JTAGS is also affected by line-of-sight disruptions such as high foliage areas, low takeoff angles, placement in fringe areas of coverage, high usage in small and close areas, susceptibility, destruction, denial, and disruption by an enemy force. For these reasons, JTAGS is generally deployed to echelons above corps (EAC) and positioned in secure rear areas.

SECURITY

3-58. JTAGS collects, processes, transmits, handles, and maintains classified data/information. JTAGS requires host-command support for physical security forces and barrier equipment. Standard Department of Defense (DOD) cryptographic equipment is used. JTAGS mission operations are conducted at the SECRET NORFORN dissemination level. A security classification guide has been produced and is maintained by the JTAGS product office to address JTAGS security and classification requirements.

PHYSICAL SECURITY

3-59. JTAGS requires military police or other security force support for perimeter security and access control. During peacetime operations, access control area lighting should be available. Supported theaters must provide required barrier materials (e.g., concertina) for site physical security. If necessary, JTAGS may be collocated within the secure perimeter of other classified elements as long as other siting requirements are met.

STATION SURVIVABILITY

3-60. JTAGS must be deployed and employed to minimize vulnerability to unconventional warfare and terrorist attacks.

SOLDIER SURVIVABILITY

3-61. The shelter affords some degree of protection from hostile small arms fire, chemical and biological agents, lasers, and natural phenomena. The shelter is ergonomically designed to lessen stress and fatigue that can be brought on during prolonged engagements and combat.

SITE CONSIDERATIONS

3-62. JTAGS does not require any of the traditional site preparation activities (e.g., foundations, pads, revetment, bunkers, etc.) prior to placing it into operation. JTAGS is capable of emplacement on improved and unimproved sites with up to 10 degrees inclination with various surfaces to include gravel, firm soil, grassy areas, light undergrowth, light to moderate snow and ice, pavement, sand, and concrete. For peacetime OCONUS deployments, the gaining command may take additional site preparation measures for placement of the JTAGS in a garrison environment. Additional site preparation information (i.e., shelter and generator size information, power requirements, etc.) is contained in Appendix B.

SECTION X ¾ COMMUNICATIONS

3-63. The information distribution architecture enables JTAGS to rapidly send data warning to users who can effectively utilize the information. Inherent in the implementation of this architecture is the need for some JTAGS recipients to relay or retransmit the information to other organizations. The development of subarchitectures to disseminate warning to the lowest levels is a critical adjunct to the missile warning architecture.

3-64. TBM attack warning and alerting messages have the highest communication precedence available. This means they can and will interrupt and override other transmissions. The communication processor function organic to JTAGS formats the data into messages that conform to the protocols of the communication, dissemination, and processing systems available for the transmission of data warning messages throughout the theater.

3-65. The CINC's OPLAN, operation plan in concept form (CONPLAN), or exercise directive will specify and authorize participation by JTAGS in theater communication networks. The CINC directs establishment of communication networks and designates which networks are to be used by JTAGS to broadcast TBM information. JTAGS contains a suite of organic communication devices to enable independent and autonomous operation and to provide for direct network accesses as needed.

BROADCAST MODES

3-66. Broadcast modes employed for both voice reporting and data warning transmissions provide for rapid, wide area dissemination of TBM warning information. The operators may initiate these broadcasts simultaneously or sequentially. However, data warning transmissions will normally precede voice reporting broadcasts. No acknowledgment of receipt of broadcast messages is required.

DATA WARNING NETWORKS

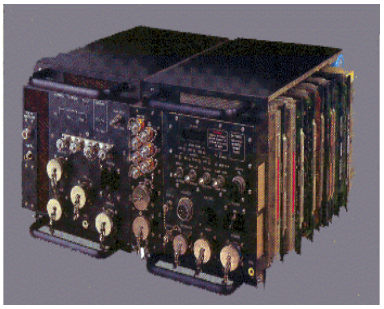
3-67. The tactical information broadcast service (TIBS) and tactical-related applications data distribution system (TDDS) broadcast networks are the primary data warning distribution means employed by JTAGS. TIBS allows JTAGS to distribute TBM information directly to TIBS subscribers. The TIBS network provides a capability to disseminate correlated, time-sensitive tactical information to joint operational users via UHF broadcasts from aircraft or fleet satellite communications (FLTSATCOM). TDDS allows JTAGS to send its information to TDDS subscribers. As the services move to multifunctional receivers and tactical data processors, all equipped users will be able to receive and use both TIBS and TDDS supplied data. See paragraphs 3-77 and 3-78 for additional information.

3-68. An organic commander's tactical terminal-hybrid (three-channel) (CTT-H3), a UHF satellite receiver transmitter, is employed by JTAGS to directly input to TIBS (see Figure 3-13). The CTT-H3 also allows for receipt of TIBS and/or TDDS traffic by JTAGS. Reports received by JTAGS via TIBS/TDDS are used to confirm output transmissions or to receive intelligence information that could enable JTAGS operators to concentrate on specific time windows or locations of probable enemy launches. TIBS can be tasked or queried by specific users. A select number of users have the ability to receive and query the TIBS network, while an unlimited number of users have a receive-only capability.

3-69. The CTT-H3 is a multiservice developed family of special application UHF SATCOM/line-of-sight communication terminals. The terminals can be dedicated to deliver critical, time-sensitive battlefield targeting information to tactical commanders and intelligence nodes at all echelons in near-real time, at collateral and system-high security levels. The terminals are fully militarized for use in combat. The CTT-H3's capabilities are summarized in Figure 3-13.

3-70. The CTT-H3 provides direct, sensor-to-shooter, secure, and dedicated sensor processing facility to C2, connectivity for rapid targeting, threat

avoidance, battle management and mission planning. The terminals can be mounted in fixed- and rotary-wing aircraft, surface, and fixed or mobile ground platforms and vehicles. Using airborne and satellite relay platforms, the terminals provide robust, reliable, jam-resistant targeting and intelligence data and voice connectivity throughout the battlefield. Intelligence data is downlinked to field terminals that interface with operator terminals or user-provided host processors and workstations. The host processor integrates this data with its other functional requirements to format, filter, process, and display threat entities/targets.



CTT/H3

- General Description and Capabilities
  - Transmits TIBS
  - Receives TIBS and TDDS
  - Size: 10.625" H x 10" W x 19.62" D (Two Units - Same Size)
  - Weight 65 lb.
- Mission Impact - Improvements
  - Direct TIBS Transmission and Receipt vs. Via STU-III
  - Direct TDDS Receipt vs. Via STU-III
  - Faster In-Theater JTAGS Data Dissemination to the Warfighter
  - Uses JTAGS Comm Processor (486 PC)
- General Information
  - Frequency Range: 225-400 MHz
  - Channelization: 5 and 25 KHz
  - Primary Power: 100-132 Vac, 47-400 Hz, Single Phase, or 200-400 Vac, 47-66 Hz, Single Phase
  - MTBF: 3000 Hours
  - MTTR: Unit Level NTE 20 Minutes, Intermediate Level NTE 3 Hours
- Additional Support Requirements
  - Network Responsibilities
  - In-Theater Support
  - Maintenance Assistance

Figure 3-13. CTT-H3

3-71. The TDDS allows worldwide reporting on missile events. Connectivity to the TDDS gateway at the CONUS tactical network mission center (TNMC) is required for injection of reports into the TDDS network. The TIBS network provides rapid distribution of data warning reports throughout the theater. JTAGS has an organic capability to uplink directly to the TIBS network. When the joint tactical information distribution system (JTIDS) is fielded, JTAGS will have an organic terminal that will provide a high-speed network connectivity to air defense systems. TBM information contained in data warning messages includes:

- Estimated launch point and time.
- State vectors.
- Estimated impact point and time.
- Other missile information.

JTAGS communications interoperability is depicted in Figure 3-14.

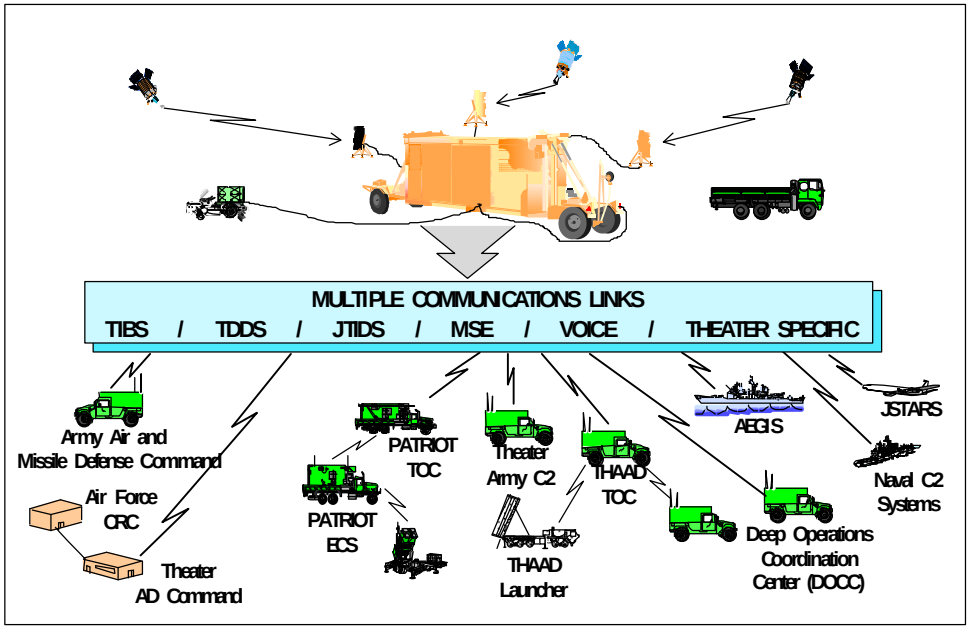


Figure 3-14. JTAGS Interoperability

VOICE REPORTING

3-72. Voice reporting of missile launches is provided from the JTAGS shelter or from a designated theater C2 element. Voice reporting may be over UHF SATCOM nets, tactical radios, or landlines. The JTAGS forward-deployed status allows each theater to customize voice-reporting procedures. JTAGS may also be tied to other theater data via hardwire and common-user voice networks in accordance with theater requirements and procedures. Voice reporting networks include the first detect/first report conference call with the theater event system and theater users; execution, warfighting, or other theater warning conference net calls including UHF early warning nets; very high frequency (VHF) inter-shelter and other command, administrative, logistic, or coordinating nets.

SECTION XI ¾ CONNECTIVITY REQUIREMENTS

VOICE LINKS

3-73. JTAGS requires three connections to some combination of multisubscriber equipment (MSE), triservice tactical communications (TRI-TAC), Defense Switching Network (DSN), or commercial phonelines for mission and administrative voice support. JTAGS mission warning may be integrated into any or all of the following radio networks: UHF SATCOM, UHF terrestrial, JTIDS, and frequency modulated (FM). These lines are used for mission voice reporting; followup reporting and coordination with the theater, MWC-T, USARSPACE, and other TES elements; and administrative voice communications.

DATA WARNING LINKS

3-74. JTAGS must be designated as a data provider on the theater TIBS network and also allocated a TIBS identification number by the theater TIBS master control station. JTAGS is able to uplink directly to TIBS, but a landline link to a backup TIBS uplink point is required. Primary and backup landlines must be established to TDDS TNMC. Additional landlines are required for the serial link interface protocol (SLIP) data connection, a JTAGS remote terminal (if required), and a backup data line. Required voice and data lines are summarized in Figure 3-15 and notionally depicted in Figure 3-16.

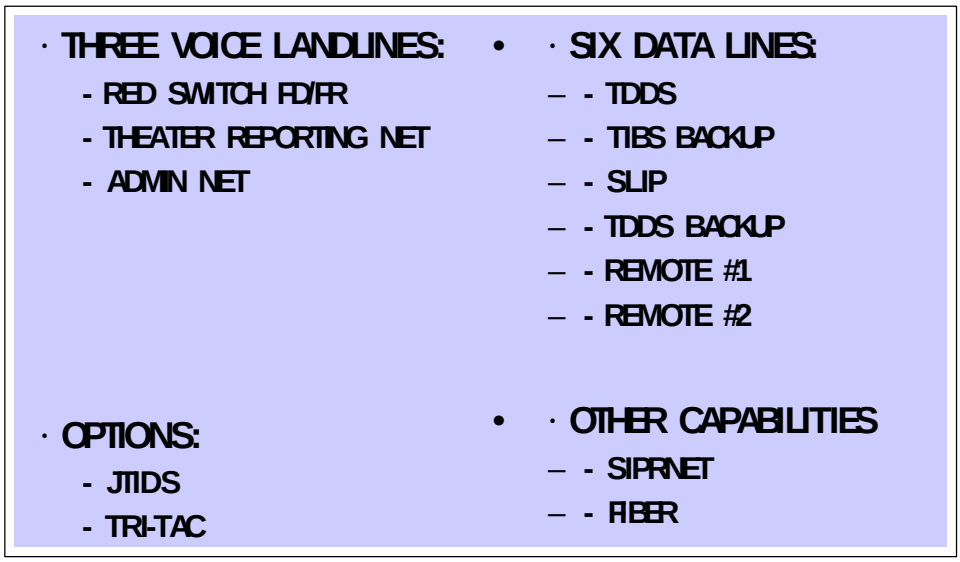


Figure 3-15. JTAGS Communication Requirements

SECTION XII – REPORTING

CLASSIFICATION AND BROADCASTING

3-75. The JTAGS system classifies track data as TBM launches or other IR events. TBM voice reporting and data warning reports are broadcast immediately as an initial warning message announcing TBM(s) in flight. The initial message includes estimated launch point and time of launch and, if sufficient data is available, predicted ground impact point/time. This message is transmitted over all communication means available to and designated for JTAGS distribution of TBM information.

MESSAGES AND REPORTS

3-76. Upon receipt of IR data on TBMs, messages and message sets containing final predicted ground impact point(s), predicted impact time(s), and state vector(s) are produced and broadcast. Users of JTAGS data

warning reports perform necessary track data fusion and correlation and trajectory extrapolations. A discussion of data warning transmissions, reports, and communications follows.

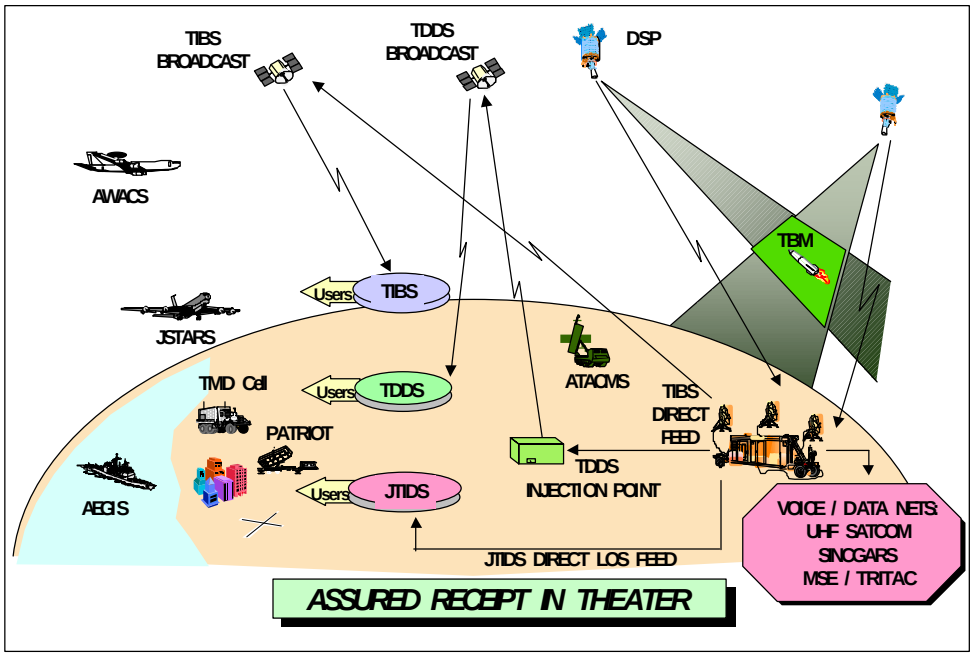


Figure 3-16. JTAGS Communications

TACTICAL INFORMATION BROADCAST SERVICE

3-77. TIBS reports are broadcast periodically, followed by updates, new data, amplifications, or deletions. Users can set filters in the CTT to reduce the volume of messages forwarded to the host workstations based on specified parameters, including geographical interest areas, altitudes, specific targets, collection parameters, etc. The Air Force Intelligence Command, Kelly Air Force Base, San Antonio, Texas, is the lead agency for TIBS development.

TACTICAL-RELATED APPLICATIONS DATA DISTRIBUTION SYSTEM

3-78. TDDS collects information from multiple sources and disseminates through a UHF SATCOM broadcast to tactical users. TDDS provides global surveillance information for sensor cueing and for integration into data bases at the various field receiver locations. Data warning is forwarded from sensor to processor to communications gateway and relays to one of the FLTSATCOM broadcast satellites for dissemination to worldwide military users. Data warning is transmitted twice to attain a statistical 99-percent guarantee of delivery. The Defense Support Project Office, Washington, DC, is the lead agency for the TDDS broadcast. Each service maintains a program office responsible for the development, deployment, and employment of its TDDS reception and exploitation devices.

JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM / TADIL-J

3-79. JTAGS has the capability to input information directly by organic radio or indirectly by interface to nonorganic radio into a theater joint TMD data warning network established specifically to support joint TMD operations and to share TMD information. This network is currently under development by the Ballistic Missile Defense Organization (BMDO) and is envisioned to be JTIDS/TADIL-J supported by an airborne relay. Since JTIDS is not an Army area common-user system, and consequently not normally available at supporting area communication nodes, JTAGS employs an organic JTIDS radio to achieve and assure access to this network. A representation of the JTAGS organic communications is shown in Figure 3-17.

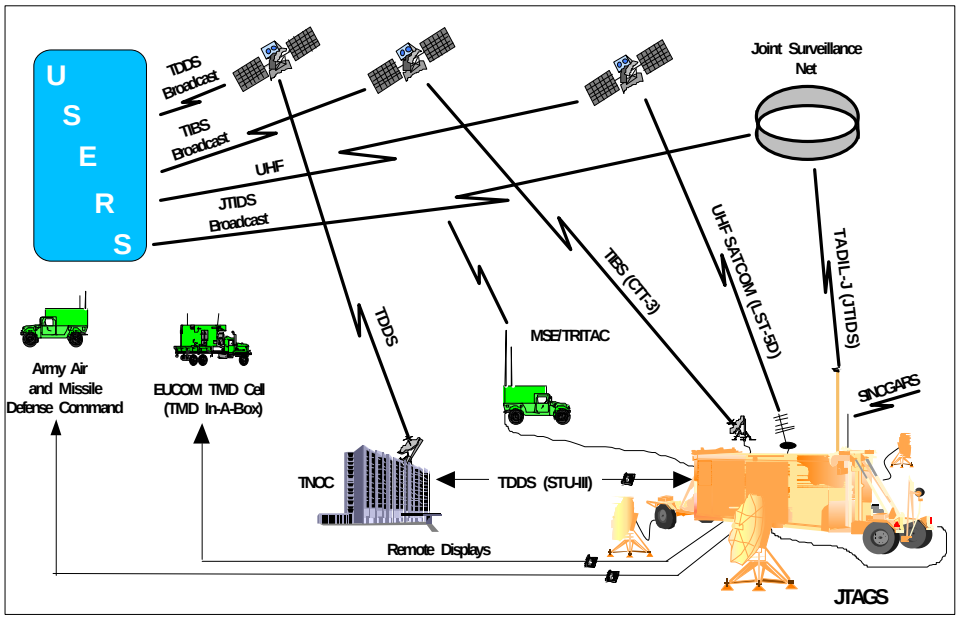


Figure 3-17. JTAGS Communications

VOICE REPORTING NETS

3-80. JTAGS has the capability to operate in voice reporting nets established by the CINCs. These nets are expected to be served by SATCOM because the traditional frequency modulation and amplitude modulation tactical networks are not normally employed at the higher echelons of a joint task force. An organic UHF single-channel SATCOM radio is used to enter specified theater voice nets, if so allowed and authorized.

SECONDARY NETS

3-81. JTAGS requires access and interfaces to other theater communication systems to provide secondary and parallel information distribution routes. Depending on the situation, JTAGS could employ a high precedence conference call to warn a preselected and predetermined set of high priority subscribers. The conference call method would allow JTAGS operators to verify that critical broadcast messages have been received. JTAGS has the capability to transmit character-oriented messages directly to addressed

command centers and/or tactical command and control system entry and interface points. Theater communication systems provide access points to long-haul communication systems and enable JTAGS to exchange non-real-time information with CONUS-based or out-of-theater support and coordination elements.